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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,010	02/22/2002	Rajiv K. Singh	5853-224	1904

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EXAMINER
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UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/082,010

Applicant(s)

SINGH ET AL.

Examiner

Lynette T. Umez-Eronini

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-10, 17-26 and 29-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 6, 17-21, 26, 29 and 31-37 is/are rejected.
- 7) ☒ Claim(s) 2-5, 8-10, 22-25, and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/8/2004 has been entered.

### ***Claim Objections***

2. Claim 37 is objected to because of the following informalities: On line 2, "pottassium" is misspelled. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 6, 17-21, 26, 29, 31, 32, 35, 36, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Hampden-Smith et al. (US 2002/0003225 A1).

Hampden-Smith teaches chemical-mechanical planarization slurries which have abrasive particles. The particles may be homogeneous particles involving multi-phase particles including multiples phases. For example, one phase may be uniformly dispersed throughout a matrix of another phase. Alternately, one phase may form an interior core while another phase forms a coating that surrounds the core ([0089]). Hampden-Smith further teaches the abrasive particles can be composite abrasive particles wherein individual particles include an abrasive phase and at least one second phase dispersed throughout the second abrasive compound [00231] and the abrasive particles can be coated abrasive particles that include a particulate coating or non-particulate (film) coating on the outer surface of the particles wherein the coating has a thickness ranging from 5 to 200 nanometers [0233]. Hampden-Smith also teaches water (same as applicants' bulk solution) is typically a major ingredient in CMP slurries and is the liquid in which abrasive particles and other components are dispersed [0240]. The above reads on,

A slurry for chemical mechanical polishing (CMP), comprising:

a bulk solution;

a plurality of composite particles, wherein said particles comprise at least one of:  
nanoporous particles,

composite particles formed from a first solid material coated with a second solid material, said second solid material being different from said first material, and

two phase composite particles where a first solid material phase is blended with a second solid material phase different from said first material phase, **in claim 1**. Since Hampden-Smith's slurry comprises the same components as applicants' slurry, then using Hampden-Smith's slurry in the same manner as claimed by applicants' would inherently result in a slurry for cmp of a structure including a refractory metal based barrier film and a dielectric film.

Hampden-Smith also teaches,

wherein said second solid material coating said first solid material comprises a nanoporous material [0233 – 0234], **in claim 6**; and

further comprising at least one organic solvent [0199], **in claim 17**.

Hampden-Smith teaches the pH of the aqueous based slurry is typically adjusted with acids or bases, often utilizing a buffer system such as acetic acid (same as applicants' carboxylic acid and passivating additive comprising carboxylic acid)/sodium acetate [0240], complexing agents [0042], and oxidizing agents, which includes but are not limited to oxidizing metal salts, chlorates, perchlorates, chlorites, iodates, nitrates, persulfates, and peroxides [0242]. The aforementioned reads on,

further comprising at least one passivating additive for inhibiting the oxidation of a copper or silver containing film, **in claim 18**;

wherein said passivating additive comprises at least one selected from the group consisting of benzotriazole (BTA), tolytriazole (TTA), imidazole, thiols, mercaptans, oxalic acid, sodium hexanoate and carboxylic acid, **in claim 19**;

further comprising at least one complexing agent, **in claim 20**;

wherein said complexing agent comprises at least one selected from the group consisting of acetic acid, citric acid, tartaric acid and succinic acid, **in claim 21**.

the slurry further comprising an oxidizer is at least one selected from the group consisting of hydrogen peroxide, potassium, ferrocyanide, potassium iodate, and perchlorates [0242], **in claims 26, 36, and 37**;

wherein said selective adsorption additive comprises at least one polymer, **in claim 29**;

further comprising at least one salt, **in claims 31 and 32**.

Hampden teaches the composite particles (same as applicants' core particles in the slurry) preferably include at least about 1 weight percent of the second phase and more preferably include from about 2 to about 50 weight percent of the second phase [0232], which reads on,

wherein a concentration of said composite particles in said slurry is from approximately 1% to 40% by weight, **in claim 35**.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hampden-Smith (USPUBS '225 A1) as applied to claim 1 above.

Hampden-Smith differs in failing to teach a pH of said slurry is respectively 6 to 13 and 8 to 11, **in claims 33 and 34.**

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to use known acid or bases as taught by Hampden-Smith, to obtain applicants' slurry having a pH of 6 to 13 and 8 to 11 for the purpose of adjusting the pH of the slurry to help aid in particle suspension (Hampden-Smith, [0240]).

#### ***Allowable Subject Matter***

8. Claims 2, 3, 4, 5, 8, 9, 10, 22, 23, 24, 25, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: As to claims 2, 3, 4, 5, 8, 9, 10, 23, 25 and 30, the prior art of record taken

alone or in combination fails to suggest, teach, and or render obvious at least and selective adsorption additive wherein said selective adsorption additive is in a concentration of from 6 to 1,000 critical micelle concentration (CMC) when said selective adsorption additive is non-ionic and from 1 to 1,000 CMC when selective adsorption additive is zwitterionic, anionic or cationic, said selective adsorption additive self assembling in said bulk solution, in combination with the rest of the limitations of the said claims.

### ***Response to Arguments***

10. Applicant's arguments filed 11/08/2004 have been fully considered but are moot in view of the new ground(s) of rejection for failure of the former prior art to teach a cmp slurry comprising at least one of: nanoporous particles, composite particles, and two phase composite particles, as recited in currently amended claim 1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 5171-272-1465.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Itue

November 23, 2004

**LAN VINH**  
**PRIMARY EXAMINER**

